

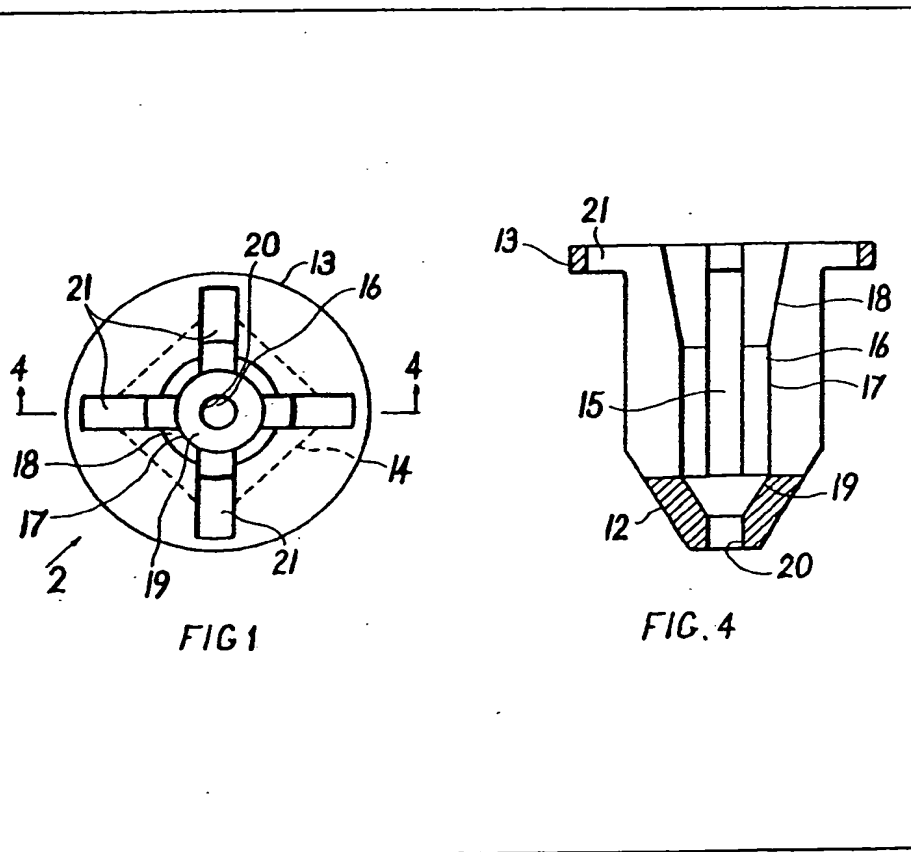
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(54) An improved grommet

(57) A grommet for mounting in a hole in a panel, such as the instrument panel of an automobile, and for engagement by a screw, comprises a hollow stem of a size to fit neatly in the hole and, at its outer end, an outwardly-extending flange which constitutes the head (13) of the grommet. The stem has a longitudinal passageway (16) for the reception of a

screw and a number of longitudinal slots extending (at 15) from the passageway through the side wall of the stem and also extending (at 21) in the head flange outwardly from the passageway, but not through to the perimeter of the flange. The external side wall (14) of the stem between each adjacent pair of slots is flat. Thus, if there are four such longitudinal slots the transverse cross-sectional shape of the stem is in the form of a square.



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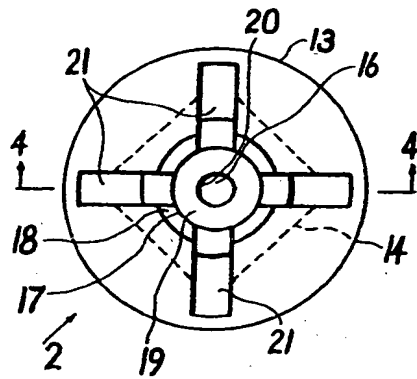


FIG. 1

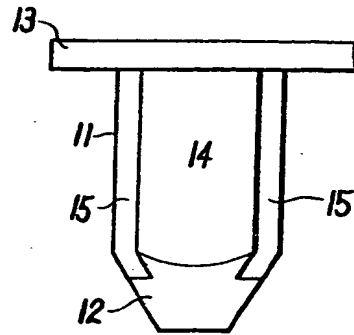


FIG. 2

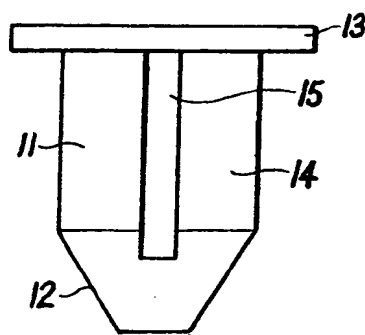


FIG. 3

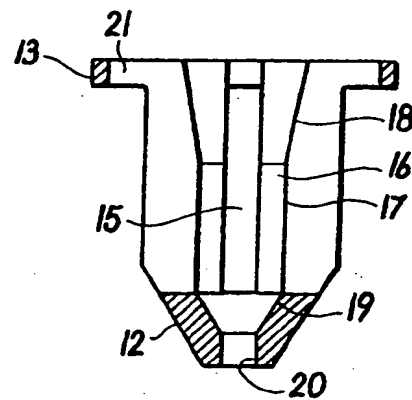


FIG. 4

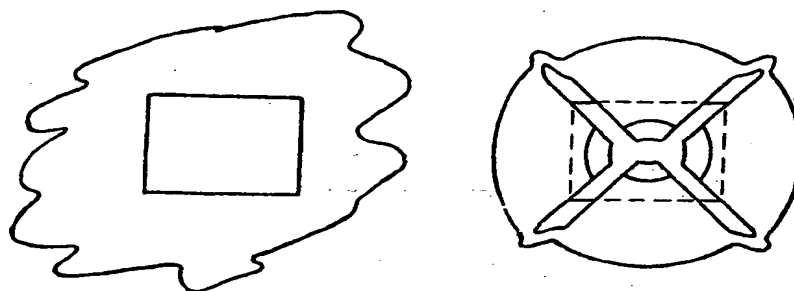


FIG. 5

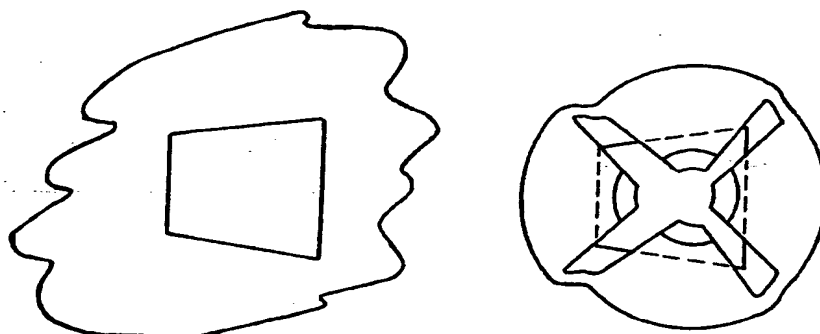


FIG. 6

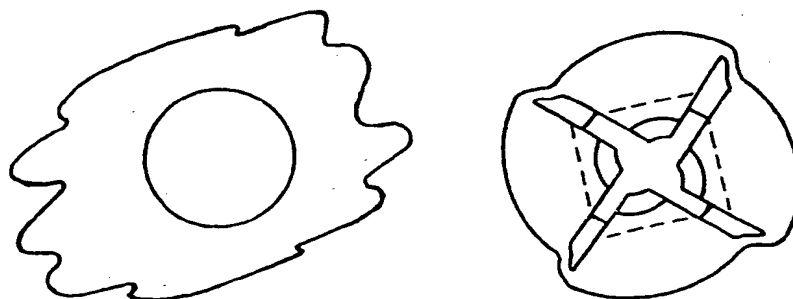


FIG. 7

SPECIFICATION

An improved grommet

This invention relates to an improved grommet and it refers particularly but not exclusively to a grommet for engagement in a panel and for the reception of a screw engaged in it.

An object of this invention is to provide a grommet having a range of application greater than grommets as hitherto provided. Another object is to provide a grommet designed for engagement in a square hole which will fit non-rotatably in holes of irregular shape and/or size — that is to say, holes which have been distorted from the square shape and/or varied from the intended size. A further object is to provide a grommet which will engage in panel holes of square, round or other shape and operate to hold screws whilst being non-turntable relative to the panels.

The grommet provided by the invention will be found to have application particularly in automotive panels.

It is known that in the production of instrument panels for use in automobiles holes provided in the panels, for the reception of grommets to be engaged by screws, are often distorted from the intended shape — such as square. A particular object is to provide a grommet which will fit neatly in such distorted holes with the head of the grommet hard against the panel and be effective in holding the screw engaged in the grommet. A supplementary object is to provide a grommet which may be used in a square hole, a distorted square hole or a round hole in a relatively soft material or in a composite material having an outer layer of relatively soft material.

According to one aspect of the invention there is provided a grommet having a hollow stem for engagement in a hole in a panel and at the rear end of the stem an outwardly extending flange constituting the head of the grommet, characterised in that a number of slots — such as four — extend the major part of the length of the stem and for a major part of the transverse dimension of the head. Preferably the front end of the stem is tapered so as to facilitate the insertion of the grommet into a hole and there is a hole of relatively small diameter at that front end.

In another aspect of the invention the grommet has a hollow stem which has several — such as four — flat sides arranged equally about the stem and separated for the major part of the length of the stem by longitudinal slots. At the rear end of the stem is the head of the grommet, being an outwardly extending flange. The slots in the stem extend through the head outwardly from the axial passageway in said stem to within a short distance of the perimeter of the flange. A tapered front end may be round in cross-sectional shape and have a small opening at its extremity.

In order that the invention may be readily understood and conveniently put into practical effect there will now be described, with reference to the accompanying illustrative drawings, one

particular construction of grommet made according to the invention. In these drawings:

Fig. 1 is a view of the grommet from the top;

Fig. 2 shows a side view of the grommet in the direction of the arrow 2 in Fig. 1;

Fig. 3 is a front elevation of the grommet shown in Fig. 1;

Fig. 4 shows a vertical cross-section on the line and in the direction of the arrows 4—4 in Fig. 1;

Fig. 5 illustrates a rectangular hole, and the manner the grommet fits in that hole;

Fig. 6 illustrates a hole of trapezoidal shape, and the manner the grommet fits in that hole; and

Fig. 7 illustrates a round hole in non-rigid material and the fitting of the grommet in that hole.

Referring initially to Figs. 1 to 4, the grommet has a stem 11 with a tapered entering end 12 of truncated conical shape at one end and a flat flanged head 13 at the other. The stem 11 has four flat sides 14 separated by longitudinal slots 15 which extend the major part of the length of the stem and into the tapered entering end 12, the four sides 14 being arranged somewhat in the form of a square. Within the stem 11, head 13 and end 12 is an axial passageway 16 having a cylindrical wall 17, an outwardly tapered wall 18, an inwardly tapered wall 19 and a short, small diameter, cylindrical wall 20. The four longitudinal slots 15 extend through the wall of the stem from the passageway 16 to the exterior and they are extended as radial slots 21 through the flanged head 13.

This grommet is moulded of a thermoplastic material such as a polyamide (nylon) in a simple 2-plate die, and it may be readily inserted in a hole in a panel by finger or thumb pressure.

The junction between the stem 11 and the underside of the head 13 is substantially square so that the head will fit flush with the panel in which the grommet is fitted.

With a screw is engaged in the grommet the sides 14 will be caused to expand behind the panel in which the grommet is fitted, so as to hold the grommet in place and resist withdrawal. The engagement of the screw with the tapered wall 19 of the passageway 16 will provide for a tighter grip as between the screw and the grommet and thus increase the stripping torque.

If the hole into which the grommet is to be placed should be of rectangular shape, not square, as illustrated in Fig. 5, it is believed the stem 11 of the grommet will distort itself so as to substantially fill the hole; similarly if the hole is of a trapezoidal or other uneven shape, as shown in Fig. 6 it is believed the stem of the grommet will collapse in two directions to enable it to be inserted into and to fit neatly in the hole. When the grommet is to be inserted in a round hole in a non-rigid material, as depicted in Fig. 7, it is believed the substantially square shape of the stem 11 will tend to distort the material having the hole so that the grommet will fit tightly in the hole and the edges of the slots 15 will provide a grip on the material so as to hold the grommet against turning

when a screw is being engaged in it.

CLAIMS

1. A grommet having a hollow stem for
engagement in a hole in a panel, an external head
flange at the outer end of the stem, and a
passageway through the head flange and in the
stem for engagement by a screw, characterised in
that there are a number of longitudinal slots in the
stem extending from the passageway through to
the outer surface of the stem and also extending in
the head flange outwardly from the passageway,
and the external surfaces of the stem between
adjacent pairs of slots is flat.

2. A grommet as claimed in Claim 1 further
characterised in that the inner front end of the
stem is tapered and the passageway extends
through that tapered inner end.

3. A grommet as claimed in Claim 2 further
characterised in that the longitudinal slots in the

stem extend into the tapered inner front end
portion.

4. A grommet as claimed in any preceding
claim further characterised in that the slots in the
head flange are substantially radial and do not
extend to the perimeter of the head.

5. A grommet as claimed in any preceding
claim further characterised in that the passageway
has an intermediate part with a substantially
cylindrical wall, an outwardly tapered outer part
and an inwardly tapered inner part.

6. A grommet as claimed in any preceding
claim further characterised in that there are four
said longitudinal slots in the stem, four said flat
external surfaces on the outer side of the stem,
and the inner end of the stem is of truncated
conical shape.

7. A grommet constructed and adapted to
function substantially as herein described with
reference to the drawings.